

### REMARKS

Reconsideration of the present application in view of the above amendments and following remarks is respectfully requested. Previously pending were claims 12, 15-17, 19, 21, 23, 27, 30-32, 34, 36-38, 40, 42, 44, and 54-58. (As an initial matter, Applicant respectfully notes that claim 34 inadvertently does not appear in the list of claims pending in the Office Action Summary, but does appear in the Status of Claims at page 2 of the Office Action.) As set forth above, Applicant has hereby amended claims 12, 16, 27, 37, and 56 to more clearly define the subject matter encompassed by the Applicant's invention, and has hereby amended claims 17, 19, 21, 23, 27, 32, 36, 38, 40, 42, 44, 54, and 58 for mere editorial purposes to clarify claim dependencies. In addition, as set forth above, the figure legend for Figure 2 has been amended to more accurately describe the figure. Support for amendments to claims 12 and 27 may be found in the application as originally filed (*see, e.g.*, specification at page 8, lines 3-5 and 19-20; Example 1; and Figure 1). Applicant also hereby submits new claims 59-69. New composition claims 59-63 essentially parallel previously added polypeptide claims 54-58. Support for new claims 64-69 may be found in the application as originally filed (*see, e.g.*, specification at page 8, lines 14-20; at page 9, lines 1-13; and Example 2, particularly at page 16, lines 24-26 and at page 17, lines 11-13). No new matter has been added. Therefore, claims 12, 15-17, 19, 21, 23, 27, 30-32, 34, 36-38, 40, 42, 44, and 54-69 are currently pending.

### **OBJECTION TO SPECIFICATION**

In the Office Action dated January 17, 2003, the amendment to the specification was objected to under 35 U.S.C. §132 as introducing new matter into the disclosure. Specifically, it asserted that the amendment introduced to the paragraph beginning at line 17 of page 3 to replace the recitation "90.3%" with "86% to 89%" is not supported by the original disclosure.

Applicant respectfully traverses the ground of objection and submits that the amendment of "90.3%" to "86% to 89%" is supported by the disclosure of the application as originally filed. As an initial matter, Applicant apologizes for inadvertently not indicating in Applicant's previous response (Paper No. 33) where support for the above-noted amendment is

located in the application as originally filed. In any case, Applicant respectfully submits that the bottom of original Figure 2 (copy enclosed) recites the heading "% of the main band:", and that below this heading in each lane is recited (from left to right) "89", "89", "86", "89", "87", and "87". Thus, the recitation found on original Figure 2 was merely moved (more appropriately) into the description of Figure 2. Moreover, the description has been further amended to more accurately describe Figure 2, wherein the description now recites "...the stained protein bands indicated that the hexavalent protein (M.W. 45 kDa) accounted for 86% to 89% of the total protein in the each sample."

Accordingly, Applicant respectfully submit that this ground of objection has been obviated and, therefore, requests that it be withdrawn.

#### **REJECTION UNDER 35 U.S.C. § 102(b)**

In the Office Action, claims 12, 15, 27 and 36 were rejected under 35 U.S.C. §102(b) as anticipated by Mori *et al.* (*Pediatr. Res.* 39:336, 1996) as evidenced by U.S. Patent No. 5,985,654 (Fischetti *et al.*) or Vashishtha *et al.* (*J. Immunol.* 250:4693, 1993). In particular, it is alleged that the recombinant fusion protein of Mori *et al.* consisting of the C repeat region of the M protein and the maltose-binding protein (MBP) anticipates the instant claimed invention because the C repeat region contains a reiterated immunogenic peptide as recited in the claims. Furthermore, it is asserted that the open claim language used in the instant claims allows for the presence of additional sequences, such as the MBP used by Mori *et al.* Finally, Fischetti *et al.* and Vashishtha *et al.* are used to allegedly show that every element of the claimed subject matter is disclosed by Mori *et al.*

Applicant respectfully traverses this ground of rejection. Applicant respectfully submits that Mori *et al.* fail to disclose every element of the instant claims and, therefore, fail to anticipate the invention as claimed. In particular, the present invention is directed, in pertinent part for this rejection, to a recombinant fusion polypeptide or a composition for promoting an immune response against Group A Streptococci comprising such a fusion polypeptide, wherein the fusion polypeptide comprises (a) a multivalent immunogenic portion wherein the immunogenic portion comprises at least two immunogenic polypeptides from Group A

streptococcal M protein, the polypeptides being an amino-terminal portion of a Group A streptococcal M protein and being capable of eliciting an immune response against Group A Streptococci; and (b) a carboxy-terminal polypeptide that protects the immunogenicity of the immunogenic portion, wherein the carboxy-terminal polypeptide is a reiteration of at least one immunogenic polypeptide from the amino-terminal of the immunogenic portion and is at the carboxy-terminal of the fusion polypeptide. In contrast, Mori *et al.* merely provide a recombinant C region from Group A streptococcal M protein fused to MBP for use in examining the IgG titers against the C region of M protein in sera from patients with rheumatic fever. That is, the C region of Group A streptococcal M protein is not part of the amino-terminal portion of the M protein (see Mori *et al.*, Figure 1A). Therefore, Mori *et al.* fail to teach or suggest a recombinant fusion protein having immunogenic polypeptides from Group A streptococcal M protein wherein the polypeptides are an amino-terminal portion of the M protein.

Accordingly, Applicant respectfully submits that the instant claims distinguish patentably over Mori *et al.* and, therefore, satisfy the requirements of 35 U.S.C. §102(b). Applicant requests that this rejection be withdrawn.

#### **REJECTIONS UNDER 35 U.S.C. § 103(a)**

(a) In the Office Action, claims 27, 30 and 31 were rejected under 35 U.S.C. §103(a) as obvious over Mori *et al.* (*Pediatr. Res.* 39:336, 1996) in view of WO 94/06421 (Dale and Lederer). In particular, it is alleged that it would have been obvious for a person having ordinary skill in the art to combine Freund's adjuvant as taught by Dale and Lederer with the fusion polypeptide of Mori *et al.* to produce the composition of the instant invention.

Applicant respectfully traverses this ground of rejection. Applicant submits that Dale and Lederer and Mori *et al.*, taken alone or in combination, fail to teach or suggest the claimed invention and, further, at the time of the instant invention, would not have motivated a person having ordinary skill in the art to arrive at the claimed invention with a reasonable expectation of success. As set forth above, Mori *et al.* fail to teach or suggest a recombinant fusion protein having immunogenic polypeptides from Group A streptococcal M protein wherein the polypeptides are an amino-terminal portion of the M protein. Therefore, the deficiencies of

Mori *et al.* are not remedied by the addition of Freund's adjuvant as taught by Dale and Lederer because a person of ordinary skill in the art could not possibly arrive at the instant invention when all elements of the claimed invention are not taught or suggested in the cited art.

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Hence, Applicant respectfully submits that a *prima facie* case of obviousness has not been established because the cited references fail to teach every limitation of the instant invention and fail to provide motivation for a person having ordinary skill in the art to modify or combine the prior art teachings to arrive at the claimed invention with a reasonable expectation of success. Accordingly, Applicant respectfully submits that the instant claims distinguish patentably over Mori *et al.* and Dale and Lederer, therefore, satisfy the requirements of 35 U.S.C. § 103(a). Applicant requests that this rejection be withdrawn.

(b) In the Office Action, claims 27, 30, 32 and 34 were rejected under 35 U.S.C. §103(a) as obvious over Mori *et al.* (*Pediatr. Res.* 39:336, 1996) in combination with U.S. Patent No. 5,334,379 (Pillai *et al.*). Specifically, it is alleged that it would have been obvious for a person having ordinary skill in the art to combine IL-2 or IL-4 as taught by Pillai *et al.* with the fusion polypeptide of Mori *et al.* to produce the composition of the instant invention with a reasonable expectation of success.

Applicant respectfully traverses this ground of rejection. Applicant submits that Mori *et al.* and Pillai *et al.*, taken alone or in combination, fail to teach or suggest the claimed invention and, further, at the time of the instant invention, would not have motivated a person having ordinary skill in the art to arrive at the claimed invention with a reasonable expectation of success. As set forth above, Mori *et al.* fail to teach or suggest a recombinant fusion protein having immunogenic polypeptides from Group A streptococcal M protein wherein the polypeptides are an amino-terminal portion of the M protein. Therefore, the deficiencies of Mori *et al.* are not remedied by the addition of an adjuvant or immunomodulatory cofactor as taught by Pillai *et al.* because a person of ordinary skill in the art could not possibly arrive at the claimed fusion polypeptide composition when all elements of the claimed invention are not taught or suggested in the cited art. Pillai *et al.*, while teaching the use of immunomodulatory factors, fail to teach or suggest any type of recombinant fusion polypeptide, much less a recombinant fusion polypeptide comprising a multivalent immunogenic portion and a C-terminal

peptide that protects the immunogenicity of the immunogenic portion. Moreover, Pillai *et al.* are silent with regard to a composition for promoting an immune response against Group A Streptococci and, consequently, fail to provide a suggestion or motivation to a person having ordinary skill in the art to combine Pillai *et al.* with Mori *et al.*

Hence, Applicant respectfully submits that a *prima facie* case of obviousness has not been established because the cited references fail to teach every limitation of the instant invention and fail to provide motivation for a person having ordinary skill in the art to modify or combine the prior art teachings to arrive at the claimed invention with a reasonable expectation of success. Accordingly, Applicant respectfully submits that the instant claims distinguish patentably over Mori *et al.* and Pillai *et al.*, therefore, satisfy the requirements of 35 U.S.C. § 103(a). Applicant requests that this rejection be withdrawn.

The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the pending claims in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited. The Examiner is urged to contact the undersigned attorney if there are any questions prior to allowance of this matter.




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PATENT TRADEMARK OFFICE

Respectfully submitted,

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Enclosure:

Copy of original Figure 2

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